



Measure Information

This document contains the information submitted by measure developers/stewards, but is organized according to NQF's measure evaluation criteria and process. The item numbers refer to those in the submission form but may be in a slightly different order here. In general, the item numbers also reference the related criteria (e.g., item 1b.1 relates to subcriterion 1b).

Brief Measure Information

NQF #: 0434

Corresponding Measures:

De.2. Measure Title: STK-01: Venous Thromboembolism (VTE) Prophylaxis

Co.1.1. Measure Steward: The Joint Commission

De.3. Brief Description of Measure: This measure captures the proportion of ischemic or hemorrhagic stroke patients who received VTE prophylaxis or have documentation why no VTE prophylaxis was given on the day of or the day after hospital admission.

This measure is a part of a set of eight nationally implemented measures that address stroke care (STK-2: Discharged on Antithrombotic Therapy, STK-3: Anticoagulation Therapy for Atrial Fibrillation/Flutter, STK-4: Thrombolytic Therapy, STK-5: Antithrombotic Therapy By End of Hospital Day 2, STK-6 Discharged on Statin Medication, STK-8: Stroke Education, and STK-10: Assessed for Rehabilitation) that are used in The Joint Commission's hospital accreditation and Disease-Specific Care certification programs.

1b.1. Developer Rationale: Stroke is the fourth leading cause of death in the United States and a leading cause of serious, long-term disability, associated with significant costs. Prevention of venous thromboembolism (VTE) through the use of prophylactic treatment for high-risk stroke patients is recommended by both the American Heart Association/American Stroke Association (AHA/ASA) and the American College of Chest Physicians (ACCP). Data suggest that VTE prophylaxis should be administered to stroke patients with restricted mobility soon after hospitalization. Results of studies evaluating the efficacy of VTE prophylaxis provide consistent findings of reductions in event rates by 50%-75% in most studies. These findings are quite consistent across hundreds of clinical trials and for many patient populations; placebo control groups are no longer considered ethical (Leizorovicz A, 2004).

Healthcare organizations that track VTE prophylaxis for internal quality improvement purposes have seen significant improvement in the measure rate over time. This measure has been included in the CMS Hospital Inpatient Quality Reporting Program for three years (i.e., FY 2015, FY 2016, FY 2017) to promote improvements in quality at the national level.

S.4. Numerator Statement: Ischemic or hemorrhagic stroke patients who received VTE prophylaxis or have documentation why no VTE prophylaxis was given on the day of or the day after hospital admission.

S.7. Denominator Statement: Ischemic or hemorrhagic stroke patients

S.10. Denominator Exclusions: • Less than 18 years of age

- Length of Stay < 2 days
- Length of Stay > 120 days
- Comfort measures only documented on day of or day after hospital arrival
- Enrolled in clinical trials related to stroke
- Admitted for elective carotid intervention

De.1. Measure Type: Process

S.23. Data Source: Electronic Health Record (Only), Paper Records

S.26. Level of Analysis: Facility, Other

IF Endorsement Maintenance – Original Endorsement Date: Jul 31, 2008 **Most Recent Endorsement Date:** Sep 22, 2016

IF this measure is included in a composite, NQF Composite#/title:

IF this measure is paired/grouped, NQF#/title:

De.4. IF PAIRED/GROUPED, what is the reason this measure must be reported with other measures to appropriately interpret results? Not Applicable

1. Evidence, Performance Gap, Priority – Importance to Measure and Report

Extent to which the specific measure focus is evidence-based, important to making significant gains in healthcare quality, and improving health outcomes for a specific high-priority (high-impact) aspect of healthcare where there is variation in or overall less-than-optimal performance. **Measures must be judged to meet all subcriteria to pass this criterion and be evaluated against the remaining criteria.**

1a. Evidence to Support the Measure Focus – See attached Evidence Submission Form
0434_Evidence_MSF5.0_Data.doc

1b. Performance Gap

Demonstration of quality problems and opportunity for improvement, i.e., data demonstrating:

- considerable variation, or overall less-than-optimal performance, in the quality of care across providers; and/or
- disparities in care across population groups.

1b.1. Briefly explain the rationale for this measure (e.g., the benefits or improvements in quality envisioned by use of this measure)

Stroke is the fourth leading cause of death in the United States and a leading cause of serious, long-term disability, associated with significant costs. Prevention of venous thromboembolism (VTE) through the use of prophylactic treatment for high-risk stroke patients is recommended by both the American Heart Association/American Stroke Association (AHA/ASA) and the American College of Chest Physicians (ACCP). Data suggest that VTE prophylaxis should be administered to stroke patients with restricted mobility soon after hospitalization. Results of studies evaluating the efficacy of VTE prophylaxis provide consistent findings of reductions in event rates by 50%-75% in most studies. These findings are quite consistent across hundreds of clinical trials and for many patient populations; placebo control groups are no longer considered ethical (Leizorovicz A, 2004).

Healthcare organizations that track VTE prophylaxis for internal quality improvement purposes have seen significant improvement in the measure rate over time. This measure has been included in the CMS Hospital Inpatient Quality Reporting Program for three years (i.e., FY 2015, FY 2016, FY 2017) to promote improvements in quality at the national level.

1b.2. Provide performance scores on the measure as specified (current and over time) at the specified level of analysis. (This is required for endorsement maintenance. Include mean, std dev, min, max, interquartile range, scores by decile. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included). This information also will be used to address the subcriterion on improvement (4b.1) under Usability and Use.

In October, 2009, The Joint Commission added the stroke (STK) measure set as a new core measure option to meet performance measurement requirements for Joint Commission hospital accreditation purposes. Below is the specified level of analysis for STK-1 beginning with discharges 4Q 2009 through December 31, 2014.

4Q 2009: 2668 denominator cases; 2220 numerator cases; 49 hospitals; 0.83208 national aggregate rate; 0.76618 mean of hospital rates; 0.22024 standard deviation; 0.96296 90th percentile rate; 0.92453 75th percentile rate/upper quartile; 0.82813 50th percentile rate/median rate; 0.69565 25th percentile rate/lower quartile; and, 0.43032 10th percentile rate .

CY 2010: 25031 denominator cases; 22083 numerator cases; 138 hospitals; 0.88223 national aggregate rate; 0.83435 mean of hospital rates; 0.16701 standard deviation; 0.9837 90th percentile rate; 0.95775 75th percentile rate/upper quartile; 0.87923 50th percentile rate/median rate; 0.78261 25th percentile rate/lower quartile; and, 0.59596 10th percentile rate.

CY 2011: 29680 denominator cases; 27393 numerator cases; 157 hospitals; 0.92294 national aggregate rate; 0.88278 mean of hospital rates; 0.14973 standard deviation; 0.99563 90th percentile rate; 0.97521 75th percentile rate/upper quartile; 0.94152 50th percentile rate/median rate; 0.85714 25th percentile rate/lower quartile; and, 0.66667 10th percentile rate.

CY 2012: 29538 denominator cases; 27859 numerator cases; 158 hospitals; 0.94316 national aggregate rate; .092953 mean of hospital rates; 0.09568 standard deviation; 1.0 90th percentile rate; 0.98851 75th percentile rate/upper quartile; 0.95652 50th percentile rate/median rate; 0.90909 25th percentile rate/lower quartile; and, 0.81619 10th percentile rate.

CY 2013: 44644 denominator cases; 42851 numerator cases; 264 hospitals; 0.95984 national aggregate rate; 0.94689 mean of hospital rates; 0.10083 standard deviation; 1.0 90th percentile rate; 0.99442 75th percentile rate/upper quartile; 0.9754 50th percentile rate/median rate; 0.94306 25th percentile rate/lower quartile; and, 0.8764 10th percentile rate.

CY 2014: 213000 denominator cases; 207132 numerator cases; 1299 hospitals; 0.97254 national aggregate rate; 0.96243 mean of hospital rates; 0.07648 standard deviation; 1.0 90th percentile rate; 1.0 75th percentile rate/upper quartile; 0.98618 50th percentile rate/median rate; 0.95853 25th percentile rate/lower quartile; and, 0.90909 10th percentile rate.

1b.3. If no or limited performance data on the measure as specified is reported in 1b2, then provide a summary of data from the literature that indicates opportunity for improvement or overall less than optimal performance on the specific focus of measurement.

Not applicable.

1b.4. Provide disparities data from the measure as specified (current and over time) by population group, e.g., by race/ethnicity, gender, age, insurance status, socioeconomic status, and/or disability. (This is required for endorsement maintenance. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities include.) This information also will be used to address the subcriterion on improvement (4b.1) under Usability and Use.

Not applicable. According to a 2011 report from the American Heart Association/American Stroke Association, racial disparities in stroke care exist and are more predominant among people < 65 years of age. Evidence of disparities in stroke care between minority groups and whites include: lack of knowledge about the risk factors for stroke; lack of awareness about stroke signs and symptoms and the need for urgent treatment; and, access to care respecting prevention services, acute stroke treatment, and rehabilitation. Differences in care are also related to the socioeconomic status of minorities, insurance coverage, cultural beliefs and attitudes, language barriers, immigration status, mistrust of the healthcare system, and the number of providers representing minority groups. These are all factors contributing to the quality of stroke care (Cruz-Flores, et al. 2011).

Each year in the United States, ~ 55,000 more women than men have a stroke. Statistical figures reveal that although women have a higher "life-time risk of stroke" than men, they have a lower "age-adjusted risk of stroke" and, women ages 45-85 have a lower overall rate of stroke. Stroke risk significantly increases for women > 85 years old; however, women live longer than men which may account in part for the difference (Roger VL, et al., 2012).

The burden of stroke is higher in Blacks or African Americans and Hispanics than whites. Racial and ethnic minorities have excess deaths from stroke and also experience greater years of potential life lost than non-Hispanic whites. The risk ratio for stroke mortality in all racial and ethnic minorities is higher in the 35-to-64-year-old age group, however, this risk decreases as people age. After age 64 non-Hispanic whites have an equal risk for stroke when compared to Hispanics and American Indian-Alaskan Natives. This equalization of rate of stroke presents again after age 85 in blacks or African Americans (Cruz-Flores, 2011).

In the national REGARDS cohort, 27,744 black and white men and women, aged > 45 years, followed over 4.4 years, and stroke-free at baseline, reported an overall age-adjusted and sex-adjusted black/white incidence rate ratio of 1.51. At ages 45 to 54 years, the rate ratio increased to 4.02 compared to 0.86 for > 85 years. A higher incidence of stroke is reported for blacks at younger ages.

The REGARDS investigators found that approximately half of racial disparity in stroke risk is attributable to traditional risk factors (primarily systolic blood pressure) and socioeconomic factors (Howard, et al., 2011). Brown and colleagues (2011) found a higher incidence of ischemic stroke in disadvantaged white neighborhoods, but found no significant associations between neighborhood socioeconomic status and ischemic stroke among blacks. A recent large population-based Canadian study examined gender-adjusted, age-adjusted prevalence of cardiovascular risk factors, heart disease and stroke in four ethnic groups: white (n=154,653); South Asian (N=3364); Chinese (n=3038); and, blacks (n=2742). Stroke incidence was highest in the South Asian group (1.7%) and lowest in the Chinese population (0.6%). The increased risk in the South Asian population was attributed to high susceptibility to insulin resistance and metabolic syndrome, and a tendency to develop diabetes mellitus at younger ages in both men and women as compared to other ethnic groups (Chiu, et al., 2010).

The BASIC (Brain Attack Surveillance in Corpus Christi) project (NINDS) demonstrated an increased incidence of stroke among Mexican Americans compared with non-Hispanic whites in a community in southeast Texas. The crude 3-year cumulative incidence (2000-2003) was 16.8 per 1000 in Mexican Americans and 13.6 per 1000 in non-Hispanic whites. Specifically, Mexican Americans had a higher cumulative incidence for ischemic stroke at younger ages (45-59 years of age: RR 2.04, 95% CI 1.55-2.69; 60-74 years of age: RR 1.58, 95% CI 1.31-1.91) but not at older ages (> 75 years of age : RR 1.12, 95% CI 0.94-1.32). Mexican Americans also had a

higher incidence of intracerebral hemorrhage and subarachnoid hemorrhage than non-Hispanic whites, adjusted for age.

There are few data published on racial differences in the use of VTE prophylaxis. A single study from a university hospital in Hawaii showed that Japanese patients were less likely to receive VTE prophylaxis than other racial groups. However this is not likely representative of practice in most US hospitals and may be appropriate based on Japanese patients' lower risk for VTE events. There are robust data on racial differences in rates of VTE based on race/ethnicity. In most studies African American men have higher rates of VTE than white patients. The lowest rates of VTE are seen in patients of Asian/Pacific Islander decent.

As previously mentioned, ethnic minorities suffer higher mortality and higher rates of more severe hemorrhagic strokes. Increased stroke severity and immobilization increase the risk of developing VTE. Although no data were found noting disparities in VTE prophylaxis administration for stroke patients, there are some data that inpatient evaluation differed between African Americans and whites.

1b.5. If no or limited data on disparities from the measure as specified is reported in 1b4, then provide a summary of data from the literature that addresses disparities in care on the specific focus of measurement. Include citations.

According to a 2011 report from the American Heart Association/American Stroke Association, racial disparities in stroke care exist and are more predominant among people < 65 years of age. Evidence of disparities in stroke care between minority groups and whites include: lack of knowledge about the risk factors for stroke; lack of awareness about stroke signs and symptoms and the need for urgent treatment; and, access to care respecting prevention services, acute stroke treatment, and rehabilitation. Differences in care are also related to the socioeconomic status of minorities, insurance coverage, cultural beliefs and attitudes, language barriers, immigration status, mistrust of the healthcare system, and the number of providers representing minority groups. These are all factors contributing to the quality of stroke care (Cruz-Flores, et al. 2011).

Each year in the United States, ~ 55,000 more women than men have a stroke. Statistics reveal that women have a higher "life-time risk of stroke" than men. (Mozaffarian D, et al., 2015). In the Framingham Heart Study, lifetime risk of stroke among those 55 to 75 years of age was 1 in 5 for women (20% to 21%) and ~1 in 6 for men (14% to 17%).

The burden of stroke is higher in Blacks or African Americans and Hispanics than whites. Racial and ethnic minorities have excess deaths from stroke and also experience greater years of potential life lost than non-Hispanic whites. The risk ratio for stroke mortality in all racial and ethnic minorities is higher in the 35-to-64-year-old age group, however, this risk decreases as people age. After age 64 non-Hispanic whites have an equal risk for stroke when compared to Hispanics and American Indian-Alaskan Natives. This equalization of rate of stroke presents again after age 85 in blacks or African Americans (Cruz-Flores, et al., 2011).

Ischemic strokes in black patients occur earlier in life, and age-standardized mortality due to ischemic stroke are higher in blacks when compared to the general population (Schwamm, L., et al., 2010). Blacks have less access to quality care, a higher prevalence of risk factors, and more severe deficit when the stroke occurs (Qian, F., et al., 2013).

In the national REGARDS cohort, 27,744 black and white men and women, aged > 45 years, followed over 4.4 years, and stroke-free at baseline, reported an overall age-adjusted and sex-adjusted black/white incidence rate ratio of 1.51. At ages 45 to 54 years, the rate ratio increased to 4.02 compared to 0.86 for > 85 years. A higher incidence of stroke is reported for blacks at younger ages.

The REGARDS investigators found that approximately half of racial disparity in stroke risk is attributable to traditional risk factors (primarily systolic blood pressure) and socioeconomic factors (Howard, et al., 2011). Brown and colleagues (2011) found a higher incidence of ischemic stroke in disadvantaged white neighborhoods, but found no significant associations between neighborhood socioeconomic status and ischemic stroke among blacks. Hispanics are at a greater risk for stroke as compared with non-Hispanic whites, even living in the same community (Schwamm, L., et al., 2010). A recent large population-based Canadian study examined gender-adjusted, age-adjusted prevalence of cardiovascular risk factors, heart disease and stroke in four ethnic groups: white (n=154,653); South Asian (N=3364); Chinese (n=3038); and, blacks (n=2742). Stroke incidence was highest in the South Asian group (1.7%) and lowest in the Chinese population (0.6%). The increased risk in the South Asian population was attributed to high susceptibility to insulin resistance and metabolic syndrome, and a tendency to develop diabetes mellitus at younger ages in both men and women as compared to other ethnic groups (Chiu, et al., 2010).

The BASIC (Brain Attack Surveillance in Corpus Christi) project (NINDS) demonstrated an increased incidence of stroke among Mexican Americans compared with non-Hispanic whites in a community in southeast Texas. The crude 3-year cumulative incidence (2000-2003) was 16.8 per 1000 in Mexican Americans and 13.6 per 1000 in non-Hispanic whites. Specifically, Mexican Americans had

a higher cumulative incidence for ischemic stroke at younger ages (45-59 years of age: RR 2.04, 95% CI 1.55-2.69; 60-74 years of age: RR 1.58, 95% CI 1.31-1.91) but not at older ages (> 75 years of age : RR 1.12, 95% CI 0.94-1.32). Mexican Americans also had a higher incidence of intracerebral hemorrhage and subarachnoid hemorrhage than non-Hispanic whites, adjusted for age.

Temporal trend data from the BASIC Project for the time period 2000 through 2010 demonstrated that ischemic stroke rates declined significantly in people aged ≥ 60 years but remained largely unchanged over time in those aged 45 to 59 years. Rates of decline did not differ significantly for non-Hispanic whites and Mexican Americans in any age group. Therefore, ethnic disparities in stroke rates in the 45- to 59-year-old and 60- to 74-year-old age groups persist (Morgenstern, et al., 2013).

Data from the most recent Greater Cincinnati Northern Kentucky Stroke Study (GCNKSS) show that compared with the 1990s, when incidence rates of stroke were stable, stroke incidence in 2005 was decreased for whites. A similar decline was not seen in blacks. These changes for whites were driven by a decline in ischemic strokes. There were no changes in incidence of ischemic stroke for blacks or of hemorrhagic strokes in blacks or whites (Kleindorfer, et al., 2010).

In an analysis of temporal trends in ischemic stroke incidence stratified by age, the GCNKSS found an increased incidence of ischemic stroke over time for both blacks and whites aged 20 to 54 years, especially in 2005 compared with earlier time periods. There were declining incidence rates in the oldest age groups for both race groups (Kissela, et al., 2012).

Qian, F., et al., (2013) found that non-Hispanic Blacks, Hispanic, and non-Hispanic Asian Americans patients were less likely to die than non-Hispanic whites, within 30 days of admission. Then again they were less likely to die within one year of admission and within one year of discharge. In comparison with non-Hispanic white patients, the measured race/ethnicity groups had a lower 30 day mortality rate of hospital admission. Survival after one year post discharge was strongest in the non-Hispanic Asian Americans. When the authors compared non-Hispanic white groups with non-Hispanic black and Hispanic groups, the non-Hispanic black and Hispanic groups had a higher one year all cause and stroke associated re hospitalization. Non-Hispanic Asian Americans had a lower one year all cause re hospitalization rate.

There are few data published on racial differences in the use of VTE prophylaxis. A single study from a university hospital in Hawaii showed that Japanese patients were less likely to receive VTE prophylaxis than other racial groups. However this is not likely representative of practice in most US hospitals and may be appropriate based on Japanese patients' lower risk for VTE events. There are robust data on racial differences in rates of VTE based on race/ethnicity. In most studies African American men have higher rates of VTE than white patients. The lowest rates of VTE are seen in patients of Asian/Pacific Islander descent.

In a study done by Schwamm, L., et al (2010), examiners found that there were modest differences in DVT Prophylaxis in black patients. Although small, it is thought they are large enough to result in the overall in hospital mortality due to pulmonary emboli. They continued to assess the evidence regarding the ability to ambulate at discharge, and found black and Hispanic patients were able to ambulate greater than the white population. This may be due to age or other unmeasured factors, and not related to quality of care.

As previously mentioned, ethnic minorities suffer higher mortality and higher rates of more severe hemorrhagic strokes. Increased stroke severity and immobilization increase the risk of developing VTE. Although no data were found noting disparities in VTE prophylaxis administration for stroke patients, there are some data that inpatient evaluation differed between African Americans and whites.

- Brown AF, Liang LJ, Vassar SD, Stein-Merkin S, Longstreth WT Jr, Ovbiagele B, Yan T, Escarce JJ. Department of Neurology, UCLA GIM&HSR. Neighborhood disadvantage and ischemic stroke: the Cardiovascular Health Study (CHS). *Stroke*. 2011;42(12): 3363-8.
- Chiu M, Austin PC, Manuel DG, Tu JV. Comparison of cardiovascular risk profiles among ethnic groups using population health surveys between 1996 and 2007. *CMAJ*. 2010;182(8):E301-10.
- Cruz-Flores S, Rabinstein A, Biller J, Elkind MSV, Griffith P, Gorelick PB, Howard G, Leira EC, Morgenstern LB, Ovbiagele B, Peterson E, Rosamond W, Trimble B, Valderrama AL, on behalf of the American Heart Association Stroke Council, Council on Cardiovascular Nursing, Council on Epidemiology and Prevention, and Council on Quality of Care and Outcomes Research. Racial-ethnic disparities in stroke care: the American experience. *Stroke*. 2011;42:2091-2116.
- Gelber RP, Seto TB. "Patient ethnicity and use of venous thromboembolism prophylaxis." *Int J Qual Health Care*. 2006; 18:23-9.
- Gillum RF, Kwagyan J, Obisesan TO. Division of Geriatrics, Howard University College of Medicine, Washington, DC, USA. Ethnic and geographic variation in stroke mortality trends. *Stroke*. 2011;42(11):3294-6.
- Heit JA, Beckman MG, Bockenstedt PL, et al. "Comparison of characteristics from White- and Black-Americans with venous

thromboembolism: a cross-sectional study." Am J Hematol. 2010; 85:467-71.

- Howard G, Cushman M, Kissela BM, Kleindorfer DO, McClure LA, Safford MM, Rhodes JD, Soliman EZ, Moy CS, Judd SE, Howard VJ; REasons for Geographic and Racial Differences in Stroke (REGARDS) Investigators. Traditional risk factors as the underlying cause of racial disparities in stroke: lessons from the half-full (empty?) glass. Stroke. 2011;(12):3369-75.
- Howard G, Howard VJ; Reasons for Geographic and Racial Differences in Stroke (REGARDS) Investigators. Ethnic disparities in stroke: the scope of the problem. Ethn Dis. 2001;11:761-768.
- Jacobs BS, Birbeck G, Mullard AJ, Hickenbottom S, Kothari R, Roberts S, Reeves MJ. Quality of hospital care in African Americans and white patients with ischemic stroke and TIA. Neurology.2006;66:809-14.
- Johnston SC, Fung LH, Gillum LA, Smith WS, Brass LM, Lichtman JH, Brown AN. Utilization of intravenous tissue-type plasminogen activator for ischemic stroke at academic medical centers.: the influence of ethnicity. Stroke. 2001; 32:1061-68.
- Karve S, Balkrishnan R, Seiber E Nahata M, Levine DA. Department of health Economics, RTI Health Solutions, Research Triangle Park, North Carolina. Population trends and disparities in outpatient utilization of neurologists for ischemic stroke. J Stroke Cerebrovasc Dis. 2011.
- Kissela BM, Khoury JC, Alwell K, Moomaw CJ, Woo D, Adeoye O, Flaherty ML, Khatr P, Ferioli S, De Los Rios La Rosa F, Broderick JP, Kleindorfer DO. Age at stroke: temporal trends in stroke incidence in a large, biracial population. Neurology. 2012;79:1781-1787.
- Kleindorfer DO, Khoury J, Moomaw CJ, Alwell K, Woo D, Flaherty ML, Khatr P, Adeoye O, Ferioli S, Broderick JP, Kissela BM. stroke incidence is decreasing in whites but not in blacks: a population-based estimate of temporal trends in stroke incidence from the Greater Cincinnati/Northern Kentucky Stroke Study. Stroke. 2010;41:1326-1331.
- Morgenstern LB, Smith MA, Sánchez BN, Brown DL, Zahuranec DB, Garcia N, Kerber KA, Skolarus LE, Meurer WJ, Burke JF, Adelman EE, Baek J, Lisabeth LD. Persistent ischemic stroke disparities despite declining incidence in Mexican Americans. Ann Neurol. 2013;74:778-785.
- Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, de Ferranti S, Després JP, Fullerton HJ, Howard VJ, Huffman MD, Judd SE, Kissela BM, Lackland DT, Lichtman JH, Lisabeth LD, Simin L, Mackey RH, matchar DB, McGuire DK, Mohler ER III, Moy CS, Muntner P, Mussolino ME, Nasir K, Neumar RW, Graham N, Palaniappan L, Pandey DK, Reeves MJ, Rodriguez CJ, Sorlie PD, Stein J, Towfighi A, Turan TN, Virani SS, Willey JZ, Woo D, Yeh RW, Turner JZ. Heart disease and stroke statistics--2015 update: a report from the American Heart Association. Circulation. 2015;131:e-151-e154.
- Qian, F, Fonarow G C., Smith E E, et al., Racial and ethnic differences in outcome in older patients with acute ischemic stroke. Circ Cardiovasc Qual Outcomes. 2013;284-292.
- Roger VL, Go AS, Lloyd-Jones DM, Benjamin EJ, Berry JD, Borden WB, Bravata DM, Dai S, Ford ES, Fox CS, Fullerton HJ, Gillespie C, Hailpern SM, Heit JA, Howard VJ, Kissela BM, Kittner SJ, Lackland DT, Lichtman JH, Lisabeth LD, Makuc DM, Marcus GM, Marelli A, Matchar DB, Moy CS, Mozaffarian D, Mussolino ME, Nichol G, Paynter NP, Soliman EZ, Sorlie PD, Sotoodehnia N, Turan TN, Virani SS, Wong ND, Woo D, and Turner MB. Heart disease and stroke statistics--2012 update: a report from the American Heart Association. Circulation. 2012;125: e78-e82.
- Schwamm L.H. Reeves, MJ, Wenqin P, et al. Race/ethnicity, quality of care, and outcomes in ischemic stroke. Circulation. 2010;121:1492-1501.
- Stein PD, Matta F. "Epidemiology and incidence: the scope of the problem and risk factors for development of venous thromboembolism." Clin Chest Med. 2010;31:611-28.
- Tang Y, Sampson B, Pack S, et al. "Ethnic differences in out-of-hospital fatal pulmonary embolism." Circulation. 2011;123:2219-25.
- White RH, Keenan CR. "Effects of race and ethnicity on the incidence of venous thromboembolism." Thromb Res. 2009;123(4):S11-7.

1c. High Priority (previously referred to as High Impact)

The measure addresses:

- a specific national health goal/priority identified by DHHS or the National Priorities Partnership convened by NQF; OR
- a demonstrated high-priority (high-impact) aspect of healthcare (e.g., affects large numbers of patients and/or has a substantial impact for a smaller population; leading cause of morbidity/mortality; high resource use (current and/or future); severity of illness; and severity of patient/societal consequences of poor quality).

1c.1. Demonstrated high priority aspect of healthcare

Affects large numbers, A leading cause of morbidity/mortality, Severity of illness

1c.2. If Other:

1c.3. Provide epidemiologic or resource use data that demonstrates the measure addresses a high priority aspect of healthcare.

List citations in 1c.4.

Stroke ranks as the number four cause of death in the United States, following diseases of the heart, cancer, and chronic lung-related diseases. Each year, ~ 795,000 people experience a new or recurrent stroke. Approximately 610,000 of these are first attacks, and 185,000 are recurrent strokes. These numbers equate to one stroke victim every 40 seconds on average. From 2001 to 2011, the relative rate of stroke death fell by 35.1% and the actual number of stroke deaths declined by 21.2%; however, one of every 20 deaths in the United States remains attributable to stroke. More women than men die of stroke each year. Women accounted for almost 60% of US stroke deaths (Mozaffarian D, et al., 2015).

Stroke is also a leading cause of long-term disability (George M, et al., 2009). Stroke was among the top 18 diseases contributing to years lived with disability in 2010; of these 18 causes, only the age-standardized rates for stroke increased significantly between 1990 and 2010 ($P < 0.05$).¹⁶⁸ (US Burden of Disease Collaborators, 2013). Among Medicare patients discharged from the hospital after stroke, ~45% return directly home, 24% are discharged to inpatient rehabilitation facilities, and 31% are discharged to skilled nursing facilities. Of stroke patients returning directly home, 32% use home healthcare services. In 2011, the direct and indirect cost of stroke was \$33.6 billion (Mozaffarian D, et al., 2015).

The 2015 report by The Agency for Healthcare Research and Quality (AHRQ) indicates that "Pharmacologic methods to prevent venous thromboembolism are safe, effective, cost-effective, and advocated by authoritative guidelines, yet large prospective studies continue to demonstrate that these preventive methods are significantly underused." Increased stroke severity and immobilization increase the risk of developing VTE. Pulmonary embolism accounts for approximately 10% of deaths after stroke, and the complication may be detected in approximately 1% of patients who have had a stroke, underscoring the importance of prevention as the most critical action step for reducing death from PE (Wijdicks and Scott, 1997). Besides being associated with life-threatening PE, symptomatic DVT also slows recovery and rehabilitation after stroke (Jauch, E.C., et al, 2013).

1c.4. Citations for data demonstrating high priority provided in 1a.3

- Adams HP, del Zoppo G, Alberts MJ, Bhatt DL, Brass L, Furlan A, Grubb RL, Higashida RT, Jauch EC, Kidwell C, Lyden PD, Morgenstern LB, Qureshi AI, Rosenwasser RH, Scott PA, Wijdicks E. Guidelines for the Early Management of Adults with Ischemic Stroke: A Guideline From the American Heart Association/American Stroke Association Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology and Intervention Council, and the Atherosclerotic Peripheral Vascular Disease and Quality of Care Outcomes in Research Interdisciplinary Working Groups. *Stroke*. 2007;38:1689-90.
- Agency for Healthcare Research and Quality. Preventing Hospital Acquired Venous Thromboembolism: A guide for effective quality improvement.—Retrieved November 4, 2015 from: <http://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/vtguide/index.html>.
- Centers for Disease Control and Prevention (CDC). Prevalence and most common causes of disability among adults—United States 2005. *MMWR*. 2009;58:421-26.
- George M, Xin T, McGruder H, Yoon P, Rosamond W, Winquist A, Hinchey J, Wall H, Pandey D. Centers for Disease Control and Prevention (CDC). Prevalence and most common causes of disability among adults—United States 2005. *MMWR*. 2009;58:421-26.
- Guyatt GH, Akl EA, Crowther M, Gutterman DD, Schunemann HJ, and for the American College of Chest Physicians Antithrombotic Therapy and Prevention of Thrombosis Panel. Executive summary: antithrombotic therapy and prevention of thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. *Chest*. 2012;141: 33S.
- Heit J. "The epidemiology of venous thromboembolism in the community." *Arteriosclerosis, Thrombosis and Vascular Biology* 2008;28(3):370.
- Jauch EC, Saver JL, Adams HP Jr, Bruno A, Connors JJ, Demerschalk BM, Khatri P, et al. "Guidelines for the Early Management of Patients with Acute Ischemic Stroke: A Guideline for Healthcare Professionals from the American Heart Association/American Stroke Association." [In Eng]. *Stroke* (Jan 31 2013).
- Kernan WN, Ovbiagele B, Black HR, Bravata DM, Chimowitz MI, Ezekowitz MD, Fang MC, Fisher M, Furie KL, Heck DV, Johnston SC, Kasner SE, Kittner SJ, Mitchell PH, Rich MW, Richardson D, Schwamm LH, Wilson JA. Guidelines for the Prevention of Stroke in Patients With Stroke or Transient Ischemic Attack: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. *Stroke*. 2014;45:241-2160-2236.
- Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, de Ferranti S, Després JP, Fullerton HJ, Howard VJ, Huffman MD, Judd SE, Kissela BM, Lackland DT, Lichtman JH, Lisabeth LD, Simin L, Mackey RH, Matchar DB, McGuire DK, Mohler ER III, Moy CS, Muntner P, Mussolino ME, Nasir K, Neumar RW, Graham N, Palaniappan L, Pandey DK, Reeves MJ, Rodriguez CJ, Sorlie PD, Stein J, Towfighi A, Turan TN, Virani SS, Willey JZ, Woo D, Yeh RW, Turner JZ. Heart disease and stroke statistics--2015 update: a report from the American Heart Association. *Circulation*. 2015;131:e-151-e154.
- National Heart, Lung, and Blood Institute, National Institutes of Health; reports on a conference that occurred in 1996. Stroke Belt Initiative: project accomplishments and lessons learned.

- Raskob GE, Silverstein R, Bratzler DW, Heit JA, White RH. "Surveillance for deep-vein thrombosis and pulmonary embolism: recommendations from a national workshop." Am J Prev Med. 2010; 38(4 Suppl):S502-9.
- Roger VL, Go AS, Lloyd-Jones DM, Benjamin EJ, Berry JD, Borden WB, Bravata DM, Dai S, Ford ES, Fox CS, Fullerton HJ, Gillespie C, Hailpern SM, Heit JA, Howard VJ, Kissela BM, Kittner SJ, Lackland DT, Lichtman JH, Lisabeth LD, Makuc DM, Marcus GM, Marelli A, Matchar DB, Moy CS, Mozaffarian D, Mussolino ME, Nichol G, Paynter NP, Soliman EZ, Sorlie PD, Sotoodehnia N, Turan TN, Virani SS, Wong ND, Woo D, and Turner MB. Heart disease and stroke statistics--2012 update: a report from the American Heart Association. Circulation. 2012;125:e-78-82, e-119-127.
- Stein PD, Matta F. "Epidemiology and incidence: the scope of the problem and risk factors for development of venous thromboembolism." Clin Chest Med. 2010; 31:611-28.
- Wijdicks EF, Scott JP. Pulmonary embolism associated with acute stroke. Mayo Clin Proc. 1997;72:297-300.

1c.5. If a PRO-PM (e.g. HRQoL/functional status, symptom/burden, experience with care, health-related behaviors), provide evidence that the target population values the measured PRO and finds it meaningful. (Describe how and from whom their input was obtained.)

Not applicable.

2. Reliability and Validity—Scientific Acceptability of Measure Properties

Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented. **Measures must be judged to meet the subcriteria for both reliability and validity to pass this criterion and be evaluated against the remaining criteria.**

2a.1. Specifications The measure is well defined and precisely specified so it can be implemented consistently within and across organizations and allows for comparability. eMeasures should be specified in the Health Quality Measures Format (HQMF) and the Quality Data Model (QDM).

De.5. Subject/Topic Area (check all the areas that apply):

Neurology : Stroke/Transient Ischemic Attack (TIA)

De.6. Non-Condition Specific (check all the areas that apply):

Primary Prevention, Safety : Complications

S.1. Measure-specific Web Page (Provide a URL link to a web page specific for this measure that contains current detailed specifications including code lists, risk model details, and supplemental materials. Do not enter a URL linking to a home page or to general information.)

http://www.jointcommission.org/specifications_manual_for_national_hospital_inpatient_quality_measures.aspx

S.2a. If this is an eMeasure, HQMF specifications must be attached. Attach the zipped output from the eMeasure authoring tool (MAT) - if the MAT was not used, contact staff. (Use the specification fields in this online form for the plain-language description of the specifications)

This is not an eMeasure Attachment:

S.2b. Data Dictionary, Code Table, or Value Sets (and risk model codes and coefficients when applicable) must be attached. (Excel or csv file in the suggested format preferred - if not, contact staff)

Attachment Attachment: Appendix_A.1.xls

S.3. For endorsement maintenance, please briefly describe any changes to the measure specifications since last endorsement date and explain the reasons.

Since the last endorsement date, the data element Reason for Oral Factor Xa was added to the measure logic and the algorithm revised based on Nov. 4, 2011 FDA approval of rivaroxaban for stroke prevention in patients with atrial fibrillation. Direct oral anticoagulant agents have been added to Appendix H, Table 2.1 VTE Prophylaxis Inclusion Table as they have been approved for the U.S. Food and Drug Administration (FDA).

All ICD-9-CM diagnosis codes and ICD-9-CM procedure codes were converted to ICD-10-CM diagnosis and ICD-10-PCS procedure codes throughout the measure specifications. The Department of Health and Human Services (HHS) mandated that all entities covered by the Health Insurance Portability and Accountability Act (HIPAA) must all transition to a new set of codes for electronic

health care transactions on October 1, 2015.

S.4. Numerator Statement (Brief, narrative description of the measure focus or what is being measured about the target population, i.e., cases from the target population with the target process, condition, event, or outcome)

IF an OUTCOME MEASURE, state the outcome being measured. Calculation of the risk-adjusted outcome should be described in the calculation algorithm.

Ischemic or hemorrhagic stroke patients who received VTE prophylaxis or have documentation why no VTE prophylaxis was given on the day of or the day after hospital admission.

S.5. Time Period for Data (What is the time period in which data will be aggregated for the measure, e.g., 12 mo, 3 years, look back to August for flu vaccination? Note if there are different time periods for the numerator and denominator.)

Episode of care.

S.6. Numerator Details (All information required to identify and calculate the cases from the target population with the target process, condition, event, or outcome such as definitions, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b)

IF an OUTCOME MEASURE, describe how the observed outcome is identified/counted. Calculation of the risk-adjusted outcome should be described in the calculation algorithm.

Four data elements are used to calculate the numerator:

- Reason for No VTE Prophylaxis – Hospital Admission - Documentation of a reason why no mechanical or pharmacological prophylaxis was administered at hospital admission.

Allowable values: Yes or No/UTD.

- Reason for Oral Factor Xa Inhibitor – Documentation of a reason why Oral Factor Xa Inhibitor was administered for VTE prophylaxis.

Allowable values: Yes or No/UTD.

- VTE Prophylaxis – The type of venous thromboembolism prophylaxis documented in the medical record.

Allowable values: 1 Low dose unfractionated heparin (LDUH); 2 Low molecular weight heparin (LMWH); 3 Intermittent pneumatic compression devices (IPC); 4 Graduated compression stockings (GCS); 5 Factor Xa Inhibitor; 6 Warfarin; 7 Venous foot pumps (VFP); 8 Oral Factor Xa Inhibitor; 9 Aspirin; A None of the above or not documented or unable to determine from medical record documentation.

- VTE Prophylaxis Date – The month, day, and year that the initial VTE prophylaxis (mechanical and/or pharmacological) was administered after hospital admission.

Patients are eligible for the numerator population when VTE Prophylaxis equals 1,2,3,5,6,7, or allowable value equals “yes” for Reason for No VTE Prophylaxis-Hospital Admission or “yes” for Reason for Oral Factor Xa Inhibitor and VTE Prophylaxis Date = 0 or 1.

S.7. Denominator Statement (Brief, narrative description of the target population being measured)

Ischemic or hemorrhagic stroke patients

S.8. Target Population Category (Check all the populations for which the measure is specified and tested if any):

Elderly

S.9. Denominator Details (All information required to identify and calculate the target population/denominator such as definitions, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b)

Seven data elements are used to calculate the denominator:

1. Admission Date – The month, day and year of admission to acute inpatient care.

2. Birthdate - The month, day and year the patient was born.

3. Clinical Trial - Documentation that during this hospital stay the patient was enrolled in a clinical trial in which patients with stroke were being studied. Allowable values: Yes or No/UTD.

4. Comfort Measures Only – The earliest day the physician/APN/PA documented comfort measures only after hospital arrival.

Allowable values: 1 (Day 0 or 1); 2 (Day 2 or after); 3 (Timing Unclear); 4 (Not Documented/UTD).

5. Discharge Date – The month day and year the patient was discharged from acute care, left against medical advice or expired during the stay.

6. Elective Carotid Intervention – Documentation demonstrates that the current admission is solely for the performance of an elective carotid intervention (e.g., elective carotid endarterectomy, angioplasty, carotid stenting).

Allowable values: Yes or No/UTD.

7. ICD-10-CM Principal Diagnosis Code - The International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) code associated with the diagnosis established after study to be chiefly responsible for occasioning the admission of the patient for this hospitalization.

Population: Discharges with ICD-10-CM Principal Diagnosis Code for ischemic or hemorrhagic stroke as defined in Appendix A, Table 8.1 or Table 8.2.

S.10. Denominator Exclusions (Brief narrative description of exclusions from the target population)

- Less than 18 years of age
- Length of Stay < 2 days
- Length of Stay > 120 days
- Comfort measures only documented on day of or day after hospital arrival
- Enrolled in clinical trials related to stroke
- Admitted for elective carotid intervention

S.11. Denominator Exclusion Details (All information required to identify and calculate exclusions from the denominator such as definitions, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b)

- The patient age in years is equal to the Discharge Date minus the Birthdate. Patients less than 18 years are excluded.
- The Length of Stay (LOS) in days is equal to the Discharge Date minus the Admission Date. If the LOS is less than 2 days or greater than 120 days, the patient is excluded.
- Patients with Comfort Measures Only allowable value of 1 (Day 0 or 1) are excluded.
- Patients are excluded if "Yes" is selected for Clinical Trial.
- Patients with ICD-10-PCS procedure codes for carotid intervention procedures as identified in Appendix A, Table 8.3, if medical record documentation states that the patient was admitted for the elective performance of this procedure are excluded.

S.12. Stratification Details/Variables (All information required to stratify the measure results including the stratification variables, definitions, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format with at S.2b)

Not applicable, the measure is not stratified.

S.13. Risk Adjustment Type (Select type. Provide specifications for risk stratification in S.12 and for statistical model in S.14-15)

No risk adjustment or risk stratification

If other:

S.14. Identify the statistical risk model method and variables (Name the statistical method - e.g., logistic regression and list all the risk factor variables. Note - risk model development and testing should be addressed with measure testing under Scientific Acceptability)

Not applicable

S.15. Detailed risk model specifications (must be in attached data dictionary/code list Excel or csv file. Also indicate if available at measure-specific URL identified in S.1.)

Note: Risk model details (including coefficients, equations, codes with descriptors, definitions), should be provided on a separate worksheet in the suggested format in the Excel or csv file with data dictionary/code lists at S.2b.

S.15a. Detailed risk model specifications (if not provided in excel or csv file at S.2b)

S.16. Type of score:

Rate/proportion

If other:

S.17. Interpretation of Score *(Classifies interpretation of score according to whether better quality is associated with a higher score, a lower score, a score falling within a defined interval, or a passing score)*

Better quality = Higher score

S.18. Calculation Algorithm/Measure Logic *(Describe the calculation of the measure score as an ordered sequence of steps including identifying the target population; exclusions; cases meeting the target process, condition, event, or outcome; aggregating data; risk adjustment; etc.)*

1. Start processing. Run cases that are included in the Stroke (STK) Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure.

2. Check Comfort Measures Only

- a. If Comfort Measures Only is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
- b. If Comfort Measures Only equals 1, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
- c. If Comfort Measures Only equals 2, 3, or 4, continue processing and proceed to Clinical Trial.

3. Check Clinical Trial

- a. If Clinical Trial is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
- b. If Clinical Trial equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
- c. If Clinical Trial equals No, continue processing and proceed to Elective Carotid Intervention.

4. Check admitted for Elective Carotid Intervention

- a. If Elective Carotid Intervention is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
- b. If Elective Carotid Intervention equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
- c. If Elective Carotid Intervention equals No, continue processing and proceed to Length of Stay calculation.

5. Calculate the Length of Stay (LOS). Length of Stay, in days, is equal to the Discharge Date minus the Admission Date.

6. Check Length of Stay (LOS)

- a. If the Length of Stay is greater than or equal to zero and less than 2, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
- b. If the Length of Stay is greater than or equal to 2, continue processing and proceed to VTE Prophylaxis.

7. Check VTE Prophylaxis

- a. If VTE Prophylaxis is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
- b. If VTE Prophylaxis equals A only, continue processing and proceed to Reason for No VTE Prophylaxis-Hospital Admission.
- c. If VTE Prophylaxis equals 1, 2, 3, 4, 5, 6, 7, 8 or 9, continue processing and proceed to step 9 and recheck VTE Prophylaxis.

8. Check Reason for No VTE Prophylaxis-Hospital Admission

- a. If Reason for No VTE Prophylaxis-Hospital Admission is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
- b. If Reason for No VTE Prophylaxis-Hospital Admission equals Yes, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
- c. If Reason for No VTE Prophylaxis-Hospital Admission equals No, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

9. Recheck VTE Prophylaxis

- a. If none of the VTE Prophylaxis equals 1, 2, 3, 5, 6 or 7, continue processing and recheck VTE Prophylaxis.
- b. If any VTE Prophylaxis equals 1, 2, 3, 5, 6 or 7, continue processing and proceed to step 13 and check VTE Prophylaxis Date.

10. Recheck VTE Prophylaxis

- a. If VTE Prophylaxis is not equal to 8, continue processing and proceed to Reasons for No VTE Prophylaxis-Hospital Admission.
- b. If any of VTE Prophylaxis equals 8, continue processing and proceed to step 12 and check Reason for Oral Factor Xa Inhibitor.

11. Check Reason for No VTE Prophylaxis-Hospital Admission

- a. If Reason for No VTE Prophylaxis-Hospital Admission is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
- b. If Reason for No VTE Prophylaxis-Hospital Admission equals Yes, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
- c. If Reason for No VTE Prophylaxis-Hospital Admission equals No, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

12. Check Reason for Oral Factor Xa Inhibitor

- a. If Reason for Oral Factor Xa Inhibitor is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
- b. If Reason for Oral Factor Xa Inhibitor equals Yes, continue processing and proceed to VTE Prophylaxis Date.
- c. If Reason for Oral Factor Xa Inhibitor equals No, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

13. Check VTE Prophylaxis Date

- a. If VTE Prophylaxis Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
- b. If VTE Prophylaxis Date equals Unable to Determine (UTD), the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
- c. If the VTE Prophylaxis Date equals a Non-Unable To Determine (non-UTD) Value, continue processing and proceed to VTE Prophylaxis Day calculation.

14. Calculate VTE Prophylaxis Day. The VTE Prophylaxis Day, in days, is equal to the VTE Prophylaxis Date minus the Admission Date.

15. Check VTE Prophylaxis Day

- a. If the VTE Prophylaxis Day is equal to zero or 1, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
- b. If the VTE Prophylaxis Day is greater than or equal to 2, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
- c. If the VTE Prophylaxis Day is less than 0, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

S.19. Calculation Algorithm/Measure Logic Diagram URL or Attachment (You also may provide a diagram of the Calculation Algorithm/Measure Logic described above at measure-specific Web page URL identified in S.1 OR in attached appendix at A.1) Available at measure-specific web page URL identified in S.1

S.20. Sampling (If measure is based on a sample, provide instructions for obtaining the sample and guidance on minimum sample size.)

IF a PRO-PM, identify whether (and how) proxy responses are allowed.

Hospitals that choose to sample have the option of sampling quarterly or sampling monthly. A hospital may choose to use a larger sample size than is required. Hospitals whose Initial Patient Population size is less than the minimum number of cases per quarter for the measure set cannot sample.

Regardless of the option used, hospital samples must be monitored to ensure that sampling procedures consistently produce statistically valid and useful data. Due to exclusions, hospitals selecting sample cases MUST submit AT LEAST the minimum required sample size.

Quarterly Sampling

The Quarterly Sample Size “n”, i.e., Minimum Required Sample Size, is based on the Initial Patient Population Size “N” for the STK Measure Set. Hospitals performing quarterly sampling for STK must ensure that their Initial Patient Population and sample sizes meet the following conditions:

If "N" >= 900, then "n" 180
 If "N" 226-899, then "n" 20% of Initial Patient Population size
 If "N" 45-225, then "n" 45
 If "N" 6-44, No sampling; 100% Initial Patient Population required
 If "N" 0-5, Submission of patient level data is not required; if submission occurs, 100% Initial Patient Population required

Monthly Sampling

The Monthly Sample Size "n", i.e., Minimum Required Sample Size, is based on the Initial Patient Population Size "N" for the STK Measure Set. Hospitals performing monthly sampling for STK must ensure that their Initial Patient Population and sample sizes meet the following conditions:

If "N" >= 300, then "n" 60
 If "N" 76-299, then "n" 20% of Initial Patient Population size
 If "N" 15-75, then "n" 15
 If "N" < 15, No sampling; 100% Initial Patient Population required

S.21. Survey/Patient-reported data (If measure is based on a survey, provide instructions for conducting the survey and guidance on minimum response rate.)

IF a PRO-PM, specify calculation of response rates to be reported with performance measure results.

Not applicable. This measure is not based on a survey or a PRO-PM.

S.22. Missing data (specify how missing data are handled, e.g., imputation, delete case.)

Required for Composites and PRO-PMs.

Any file with missing data will result in a measure category assignment of X and rejection of the file from the warehouse, unless the data are not used to process the measure. If the data are used to process the measure and have been reported by the abstractor as No/UTD, the case will result in a measure category assignment of D (i.e., failed measure, not rejected).

S.23. Data Source (Check ONLY the sources for which the measure is SPECIFIED AND TESTED).

If other, please describe in S.24.

Electronic Health Record (Only), Paper Records

S.24. Data Source or Collection Instrument (Identify the specific data source/data collection instrument e.g. name of database, clinical registry, collection instrument, etc.)

IF a PRO-PM, identify the specific PROM(s); and standard methods, modes, and languages of administration.

Each data element in the data dictionary includes suggested data sources. The data are collected using contracted Performance Measurement Systems (vendors) that develop data collection tools based on the measure specifications. The tools are verified and tested by Joint Commission staff to confirm the accuracy and conformance of the data collection tool with the measure specifications. The vendor may not offer the measure set to hospitals until verification has been passed.

S.25. Data Source or Collection Instrument (available at measure-specific Web page URL identified in S.1 OR in attached appendix at A.1)

No data collection instrument provided

S.26. Level of Analysis (Check ONLY the levels of analysis for which the measure is SPECIFIED AND TESTED)

Facility, Other

S.27. Care Setting (Check ONLY the settings for which the measure is SPECIFIED AND TESTED)

Hospital

If other:

S.28. COMPOSITE Performance Measure - Additional Specifications (Use this section as needed for aggregation and weighting rules, or calculation of individual performance measures if not individually endorsed.)

Not applicable.

2a. Reliability – See attached Measure Testing Submission Form

2b. Validity – See attached Measure Testing Submission Form

3. Feasibility

Extent to which the specifications including measure logic, require data that are readily available or could be captured without undue burden and can be implemented for performance measurement.

3a. Byproduct of Care Processes

For clinical measures, the required data elements are routinely generated and used during care delivery (e.g., blood pressure, lab test, diagnosis, medication order).

3a.1. Data Elements Generated as Byproduct of Care Processes.

generated by and used by healthcare personnel during the provision of care, e.g., blood pressure, lab value, medical condition, Coded by someone other than person obtaining original information (e.g., DRG, ICD-9 codes on claims), Abstracted from a record by someone other than person obtaining original information (e.g., chart abstraction for quality measure or registry), Other If other: Data element allowable values are selected, either manually or electronically, from clinical and coded data available in medical record documentation. All medical record documentation is used in the abstraction process. Vendor data collection tools are used to import data elements needed for measure rate calculation.

3b. Electronic Sources

The required data elements are available in electronic health records or other electronic sources. If the required data are not in electronic health records or existing electronic sources, a credible, near-term path to electronic collection is specified.

3b.1. To what extent are the specified data elements available electronically in defined fields? (*i.e., data elements that are needed to compute the performance measure score are in defined, computer-readable fields*)

Some data elements are in defined fields in electronic sources

3b.2. If ALL the data elements needed to compute the performance measure score are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using other than electronic sources.

The Joint Commission recognizes that not all hospitals currently have the capacity to abstract the electronic version of this measure, so continues to offer this chart-abstracted version which allows for data capture from unstructured data fields.

3b.3. If this is an eMeasure, provide a summary of the feasibility assessment in an attached file or make available at a measure-specific URL.

Attachment:

3c. Data Collection Strategy

Demonstration that the data collection strategy (e.g., source, timing, frequency, sampling, patient confidentiality, costs associated with fees/licensing of proprietary measures) can be implemented (e.g., already in operational use, or testing demonstrates that it is ready to put into operational use). For eMeasures, a feasibility assessment addresses the data elements and measure logic and demonstrates the eMeasure can be implemented or feasibility concerns can be adequately addressed.

3c.1. Describe what you have learned/modified as a result of testing and/or operational use of the measure regarding data collection, availability of data, missing data, timing and frequency of data collection, sampling, patient confidentiality, time and cost of data collection, other feasibility/implementation issues.

IF a PRO-PM, consider implications for both individuals providing PROM data (patients, service recipients, respondents) and those whose performance is being measured.

At the present time, hospitals using this performance measure generally collect measure data via manual review of the paper medical record, the EHR or a combination of both. Collected data are submitted to The Joint Commission on a quarterly basis, by way of contracted performance measurement system vendors, as described previously. Specifications for this measure are freely available to anyone who wishes to use the measure. Feedback from hospitals using this measure indicates that required data elements are generally available in the medical record, and measure specifications are robust and easy to understand. As described above, as feedback from measure users has indicated the need for clarification or revision of measure specifications, this has taken place in the form of guidelines for abstraction. Specific revisions are detailed in the Release Notes section of this submission.

3c.2. Describe any fees, licensing, or other requirements to use any aspect of the measure as specified (e.g., value/code set, risk

model, programming code, algorithm).

There are no fees or licensing requirements to use the Joint Commission performance measures, all of which are in the public domain.

4. Usability and Use

Extent to which potential audiences (e.g., consumers, purchasers, providers, policy makers) are using or could use performance results for both accountability and performance improvement to achieve the goal of high-quality, efficient healthcare for individuals or populations.

4a. Accountability and Transparency

Performance results are used in at least one accountability application within three years after initial endorsement and are publicly reported within six years after initial endorsement (or the data on performance results are available). If not in use at the time of initial endorsement, then a credible plan for implementation within the specified timeframes is provided.

4.1. Current and Planned Use

NQF-endorsed measures are expected to be used in at least one accountability application within 3 years and publicly reported within 6 years of initial endorsement in addition to performance improvement.

Planned	Current Use (for current use provide URL)
	<p>Public Reporting Quality Check® http://www.qualitycheck.org/consumer/searchQCR.aspx Hospital Compare https://www.medicare.gov/hospitalcompare/search.html</p> <p>Public Health/Disease Surveillance Paul Coverdell National Acute Stroke Registry http://www.cdc.gov/dhdsr/programs/stroke_registry.htm</p> <p>Payment Program Hospital Inpatient Quality Reporting Program https://www.cms.gov/medicare/quality-initiatives-patient-assessment-instruments/hospitalqualityinits/hospitalrhqdapu.html</p> <p>Regulatory and Accreditation Programs Hospital Accreditation Program XX Hospital Accreditation Program http://www.jointcommission.org/</p> <p>Quality Improvement (Internal to the specific organization) Disease-Specific Care Certification for Comprehensive Stroke Centers http://www.jointcommission.org/certification/dsc_home.aspx Disease-Specific Care Certification for Primary Stroke Centers http://www.jointcommission.org/certification/dsc_home.aspx</p>

4a.1. For each CURRENT use, checked above, provide:

- Name of program and sponsor
- Purpose
- Geographic area and number and percentage of accountable entities and patients included
- Name of program and sponsor: Quality Check®; The Joint Commission
- Purpose: A public website that allows consumers to: search for accredited and certified organizations by city and state, by name or by zip code (up to 250 miles); find organizations by type of service provided within a geographic area; download free hospital performance measure results; and, print a list of Joint Commission certified disease-specific care programs and health care staffing firms.

- Geographic area and number and percentage of accountable entities and patients included: Nationwide; 3300 Joint Commission-accredited hospitals (2014)
- Name of program and sponsor: Hospital Compare; Centers for Medicare & Medicaid Services
- Purpose: A public website that provides information that helps consumers decide where to obtain healthcare and encourages hospitals to improve the quality of care they provide.
- Geographic area and number and percentage of accountable entities and patients included: Nationwide; 4000+ Medicare-certified hospitals (2015)
- Name of program and sponsor: Paul Coverdell National Acute Stroke Registry; Centers for Disease Control and Prevention
- Purpose: A national registry that measures, tracks, and improves the quality of care and access to care for stroke patients from onset of stroke symptoms through rehabilitation and recovery; decreases rate of premature death and disability from stroke; eliminates disparities in care; supports the comprehensive stroke system across the continuum of care; improves access to rehabilitation and opportunities for recovery after stroke; and, increases the workforce capacity and scientific knowledge of stroke care within stroke systems of care.
- Geographic area and number and percentage of accountable entities and patients included: 11 states; 403 hospitals (CDC, 2014)
- Name of program and sponsor: Hospital Inpatient Quality Reporting Program; Centers for Medicare & Medicaid Services
- Purpose: The Hospital Inpatient Quality Reporting (Hospital IQR) program was mandated by Section 501(b) of the Medicare Prescription Drug, Improvement, and Modernization Act (MMA) of 2003. This section of the MMA authorized CMS to pay hospitals that successfully report designated quality measures a higher annual update to their payment rates.
- Geographic area and number and percentage of accountable entities and patients included: Nationwide; 3500 hospitals (2015)
- Name of program and sponsor: Annual Report-Improving America's Hospitals; The Joint Commission
- Purpose: The annual report summarizes the performance of Joint Commission-accredited hospitals on 46 accountability measures of evidence-based care processes closely linked to positive patient outcomes, and provides benchmarks from Top Performer on Key Quality Measures® hospitals.
- Geographic area and number and percentage of accountable entities and patients included: Nationwide; 3300 Joint Commission-accredited hospitals (2014)
- Name of program and sponsor: Disease-Specific Care Certification for Comprehensive Stroke Centers; The Joint Commission
- Purpose: A certification program that recognizes the specific capabilities of hospitals that treat the most complex stroke cases.
- Geographic area and number and percentage of accountable entities and patients included: Nationwide; 95 hospitals
- Name of program and sponsor: Disease-Specific Care Certification for Primary Stroke Centers; The Joint Commission
- Purpose: A certification program that recognizes hospitals that effectively manage and meet the unique and specialized needs of stroke patients, and make exceptional efforts to foster improved outcomes for better stroke care.
- Geographic area and number and percentage of accountable entities and patients included: Nationwide; 1079 hospitals
- Name of program and sponsor: Hospital Accreditation Program; The Joint Commission
- Purpose: An accreditation program that recognizes hospitals that meet standard requirements to provide safe and effective patient care.
- Geographic area and number and percentage of accountable entities and patients included: Nationwide; 3300 Joint Commission-accredited hospitals (2014)

4a.2. If not currently publicly reported OR used in at least one other accountability application (e.g., payment program, certification, licensing) what are the reasons? (e.g., Do policies or actions of the developer/steward or accountable entities restrict access to performance results or impede implementation?)
Not applicable

4a.3. If not currently publicly reported OR used in at least one other accountability application, provide a credible plan for implementation within the expected timeframes -- any accountability application within 3 years and publicly reported within 6 years of initial endorsement. (Credible plan includes the specific program, purpose, intended audience, and timeline for implementing the measure within the specified timeframes. A plan for accountability applications addresses mechanisms for data aggregation and reporting.)

Not applicable

4b. Improvement

Progress toward achieving the goal of high-quality, efficient healthcare for individuals or populations is demonstrated. If not in use for performance improvement at the time of initial endorsement, then a credible rationale describes how the performance results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.

4b.1. Progress on Improvement. (Not required for initial endorsement unless available.)

Performance results on this measure (current and over time) should be provided in 1b.2 and 1b.4. Discuss:

- Progress (trends in performance results, number and percentage of people receiving high-quality healthcare)
- Geographic area and number and percentage of accountable entities and patients included

Progress (trends in performance results, number and percentage of people receiving high-quality healthcare:

The rate of VTE prophylaxis has steadily increased over the past five years based on Joint Commission ORYX performance measurement data. The national aggregate rate reported for 2014 was 97.3%. A gap of 9-10% still exists for the 10th percentile of hospitals. Modest differences in VTE prophylaxis in black patients have been reported by GWTG (Schwamm, 2010).

Geographic area and number and percentage of accountable entities and patients included:

Nationwide; 1299 hospitals; 213,000 patients (The Joint Commission, 2014)

4b.2. If no improvement was demonstrated, what are the reasons? If not in use for performance improvement at the time of initial endorsement, provide a credible rationale that describes how the performance results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.

Not applicable

4c. Unintended Consequences

The benefits of the performance measure in facilitating progress toward achieving high-quality, efficient healthcare for individuals or populations outweigh evidence of unintended negative consequences to individuals or populations (if such evidence exists).

4c.1. Were any unintended negative consequences to individuals or populations identified during testing; OR has evidence of unintended negative consequences to individuals or populations been reported since implementation? If so, identify the negative unintended consequences and describe how benefits outweigh them or actions taken to mitigate them.

As a requirement for inclusion of the stroke measures as a core measure set in the Specifications Manual for National Hospital Inpatient Quality Measures (October 2009), the STK-1 algorithm was revised to align with specifications for similar core measure sets. Subsequently, allowable value (9) aspirin was added to the data element VTE Prophylaxis for the Surgical Care Improvement Project (SCIP) VTE measures. The addition of aspirin in the data element caused a need to educate stroke abstractors that aspirin alone without another form of VTE Prophylaxis or a documented reason why only aspirin was administered for prophylaxis is needed, as aspirin is not approved by the U.S. Food and Drug Administration (FDA) for VTE prophylaxis in the stroke population.

5. Comparison to Related or Competing Measures

If a measure meets the above criteria and there are endorsed or new related measures (either the same measure focus or the same target population) or competing measures (both the same measure focus and the same target population), the measures are compared to address harmonization and/or selection of the best measure.

5. Relation to Other NQF-endorsed Measures

Are there related measures (conceptually, either same measure focus or target population) or competing measures (conceptually both the same measure focus and same target population)? If yes, list the NQF # and title of all related and/or competing measures.

Yes

5.1a. List of related or competing measures (selected from NQF-endorsed measures)

0218 : Surgery Patients Who Received Appropriate Venous Thromboembolism Prophylaxis Within 24 Hours Prior to Surgery to 24 Hours After Surgery

0239 : Perioperative Care: Venous Thromboembolism (VTE) Prophylaxis

0371 : Venous Thromboembolism Prophylaxis

0372 : Intensive Care Unit Venous Thromboembolism Prophylaxis

5.1b. If related or competing measures are not NQF endorsed please indicate measure title and steward.

0217 : Surgery Patients with Recommended Venous Thromboembolism (VTE) Prophylaxis Ordered; Centers for Medicare and Medicaid Services

0240: Stroke and Stroke Rehabilitation: Venous Thromboembolism (VTE) Prophylaxis for Ischemic Stroke or Intracranial Hemorrhage; American Academy of Neurology

5a. Harmonization

The measure specifications are harmonized with related measures;

OR

The differences in specifications are justified

5a.1. If this measure conceptually addresses EITHER the same measure focus OR the same target population as NQF-endorsed measure(s):

Are the measure specifications completely harmonized?

No

5a.2. If the measure specifications are not completely harmonized, identify the differences, rationale, and impact on interpretability and data collection burden.

Measures NQF# 0371 and NQF# 0372 are Venous Thromboembolism (VTE) measures which specifically exclude the stroke population. The measures are completely harmonized in terms of measure specifications and data element definitions; NQF# 0218 addresses the surgical population only, and therefore do not apply to stroke patients. Common data elements with this measure have been completely harmonized. Measure 0239 is a physician performance measure with a targeted population of surgical patients identified through CPT codes and thus is a different level of measurement. This measure evaluates physician practice as opposed to hospital processes.

5b. Competing Measures

The measure is superior to competing measures (e.g., is a more valid or efficient way to measure);

OR

Multiple measures are justified.

5b.1. If this measure conceptually addresses both the same measure focus and the same target population as NQF-endorsed measure(s):

Describe why this measure is superior to competing measures (e.g., a more valid or efficient way to measure quality); OR provide a rationale for the additive value of endorsing an additional measure. (Provide analyses when possible.)

Not Applicable

Appendix

A.1 Supplemental materials may be provided in an appendix. All supplemental materials (such as data collection instrument or methodology reports) should be organized in one file with a table of contents or bookmarks. If material pertains to a specific submission form number, that should be indicated. Requested information should be provided in the submission form and required attachments. There is no guarantee that supplemental materials will be reviewed.

Available at measure-specific web page URL identified in S.1 Attachment:

Contact Information

Co.1 Measure Steward (Intellectual Property Owner): The Joint Commission

Co.2 Point of Contact: JohnMarc, Alban, jalban@jointcommission.org, 630-792-5304-

Co.3 Measure Developer if different from Measure Steward: The Joint Commission

Co.4 Point of Contact: Karen, Kolbusz, kkolbusz@jointcommission.org, 630-792-5931-

Additional Information

Ad.1 Workgroup/Expert Panel involved in measure development

Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role

in measure development.

The role of the Technical Advisory Panel (TAP) is to provide advisory oversight in literature review, measure content and maintenance of the specifications.

Members are:

Harold P. Adams, Jr., MD
University of Iowa Health Care
Iowa City, IA

Mark J. Alberts, MD
University of Texas Southwestern
Dallas, TX

Anne W. Alexandrov, RN
Health Outcomes Institute
Fountain Hills, AZ

Nadine Allyn, RD
American Heart Association
Dallas, Texas

Mary G. George, MD
Centers for Disease Control and Prevention
Atlanta, GA

Martin Gizzi, MD
Legacy Health System
Portland, OR

Marianna Gorbaty
Mathematica Policy Research, Inc.
Washington, DC

Judith Hinchey, MD
Tuft's Medical School
Steward St. Elizabeth's Medical Center
Boston, MA

Edward C. Jauch, MD
Medical University of South Carolina
Charleston, SC 2946

Irene Katzan, MD
Cleveland Clinic
Cleveland, OH

Kimberly E. Levasseur-Franklin, PharmD
Northwestern Memorial Hospital
Chicago, IL

Kathy Morrison, RN
Penn State Hershey Medical Center
Hershey, PA

Marilyn M. Rymer, MD

University of Kansas
Kansas City, MO

Jeffrey Saver, MD
UCLA Medical Center
Los Angeles, CA

Lee H. Schwamm, MD
Harvard Medical School
Massachusetts General Hospital
Boston, MA

Deborah, Summers, RN
St. Luke's Brain and Stroke Institute
Kansas City, MO

Osama O. Zaidat, MD
St. Vincent Mercy Hospital
Toledo, OH

Richard D. Zorowitz, MD
Medstar National Rehabilitation Network
Washington, DC

Measure Developer/Steward Updates and Ongoing Maintenance

Ad.2 Year the measure was first released: 2009

Ad.3 Month and Year of most recent revision: 10, 2015

Ad.4 What is your frequency for review/update of this measure? Biannual

Ad.5 When is the next scheduled review/update for this measure? 07, 2016

Ad.6 Copyright statement: No royalty or use fee is required for copying or reprinting this manual, but the following are required as a condition of usage: 1) disclosure that the Specifications Manual is periodically updated, and that the version being copied or reprinted may not be up-to-date when used unless the copier or printer has verified the version to be up-to-date and affirms that, and 2) users participating in Joint Commission accreditation, including ORYX® vendors, are required to update their software and associated documentation based on the published manual production timelines.

Ad.7 Disclaimers:

Ad.8 Additional Information/Comments: